AIR FORCE

QUALIFICATION TRAINING PACKAGE (AFQTP)

for

PAVEMENTS AND CONSTRUCTION EQUIPMENT OPERATOR

(3E2X1)

MODULE 17

LIQUID MATERIAL DISTRIBUTORS

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MODULE 17
LIQUID MATERIAL DISTRIBUTORS

Career Field Education and Training Plan (CFETP) references from 1 Apr 97 version.

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AIR FORCE QUALIFICATION TRAINING PACKAGES
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INTRODUCTION

Before starting this AFQTP, refer to and read the "Trainee/Trainer Guide" located on the AFCESA Web site **http://www.afcesa.af.mil/**

AFQTPs are mandatory and must be completed to fulfill task knowledge requirements on core and diamond tasks for upgrade training. ***It is important for the trainer and trainee to understand*** that an AFQTP ***does not*** replace hands-on training, nor will completion of an AFQTP meet the requirement for core task certification. AFQTPs will be used in conjunction with applicable technical references and hands-on training.

AFQTPs and Certification and Testing (CerTest) must be used as minimum upgrade requirements for Diamond tasks.

MANDATORY minimum upgrade requirements:

Core task:
AFQTP completion
Hands-on certification

Diamond task:
AFQTP completion
CerTest completion (80% minimum to pass)

Note: *Trainees will receive hands-on certification training for Diamond Tasks when equipment becomes available either at home station or at a TDY location*.

Put this package to use. Subject matter experts under the direction and guidance of HQ AFCESA/CEOF revised this AFQTP. If you have any recommendations for improving this document, please contact the Career Field Manager at the address below.

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Notice. This AFQTP is *NOT* intended to replace the applicable technical references nor is it intended to replace hands-on training. It is to be used in conjunction with these for training purposes only.

WATER DISTRIBUTOR

MODULE 14 **AFQTP UNIT 1**

PERFORM OPERATIONAL CHECKS (17.2.1.)

Notice. This AFQTP is *NOT* intended to replace the applicable technical references nor is it intended to replace hands-on training. It is to be used in conjunction with these for training purposes only.

PERFORM OPERATIONAL CHECKS

Task Training Guide

STS Reference Number/Title:	17.2.1. Perform Operational Checks
Training References:	• Local Technical Orders • Local Procedures
Prerequisites:	• Possess as a minimum a 3E231 AFSC.
Equipment/Tools Required:	• Water Distributor • Personal Safety Equipment
Learning Objective:	• The trainee will be able to perform operational checks on a water distributor.
Samples of Behavior:	• The trainee will demonstrate the proper procedures for operational checks.
Notes:	
• Personnel are required to wear all personal protective equipment pertaining to each task (i.e. work gloves, hearing protection, and safety goggles)	
• Any safety violation is an automatic failure.	

PERFORM OPERATIONAL CHECKS

Background: There are several makes of the same type of equipment found in the Air Force inventory. Specific pre-operational inspection procedures can be found in the owner's manual that accompanied the equipment. It is important to properly check and service the equipment prior to operation.

To perform the tasks, follow these steps:

Step 1: Utilizing AF Form 1806
Check all items listed that pertain to the specific equipment you are checking.

Step 2: Vehicle Exterior
Inspection of the vehicle exterior begins with a 360-degree walk-around looking for damage and leaks. Check wheels/tires for wear, lug-nut tightness, and correct air pressure. Check mirrors and windows for cleanliness and cracks.

HINT:
Puddles of fluid and dirty areas on the engine or ground normally indicate problem areas and should be investigated prior to operating.

Step 3: Drive Engine Compartment
Check engine oil, coolant, brake, power steering, and transmission fluid levels and fill as needed. Inspect the drive belts for wear, tension, and alignment. Ensure battery connections are secure and free from corrosion.

Step 4: Liquid Material Distributor Unique Items
The following items are unique to the water distributor and not listed on the AF Form 1806, but must be checked during the pre-operational inspection. Add them to the AF Form 1806 in the space provided for additional items. Check the water tank, water pump, cast iron spray bar assembly, valves, and hoses for cracks, leaks, wear, and operability.

Step 5: Auxiliary Engine. Check the engine oil, fuel, and coolant for proper levels. Inspect the drive belts for wear, tension, and alignment. Ensure battery connections are secure and free from corrosion. Inspect the exhaust system for required repairs.

Review Questions
for
Perform Operational Checks

Question	Answer
1. Check wheels and tires for _____.	a. wear b. lug-nut tightness c. correct air pressure d. All the above
2. Before you operate any piece of equipment, you must inspect it for _____.	a. signs of damage or possible defects b. color c. bombs d. height limitations
3. You must use a checklist to do your inspections. The one most often used is the _____.	a. AF Form 2209 b. AF form 373 c. AF Form 1806 d. AF Form 332
4. Walk-around inspections only include detecting leaks, broken or missing items, and flat tires.	a. True b. False
5. Which of the following item is not unique to the water truck?	a. Water tank b. Water pump c. Water bucket d. Water spray bar

PERFORM OPERATIONAL CHECKS

Performance Checklist		
Step	**Yes**	**No**
1. Utilized AF Form 1806?		
2. Inspected vehicle exterior?		
3. Inspected drive engine compartment?		
4. Inspected auxiliary engine?		
5. Inspected water distributor unique items?		
6. Performed required maintenance?		

FEEDBACK: Trainer should provide positive and/or negative feedback to the trainee immediately after the task is performed. This will ensure the issue is still fresh in the mind of both the trainee and trainer.

WATER DISTRIBUTOR

MODULE 17 **AFQTP UNIT 2**

GRAVITY FEED (17.2.2.1.)

PRESSURE SPRAY (17.2.2.2.)

Notice. This AFQTP is *NOT* intended to replace the applicable technical references nor is it intended to replace hands-on training. It is to be used in conjunction with these for training purposes only.

GRAVITY FEED

PRESSURE SPRAY

Task Training Guide

STS Reference Number/Title:	17.2.2.1. Gravity Feed 17.2.2.2. Pressure Spray
Training References:	• T.O.s 36C5, 36C20 Series • Owner's Manual • Local Procedures
Prerequisites:	• Possess as a minimum a 3E231 AFSC
Equipment/Tools Required:	• Personal Protective Equipment • Water Distributor • Water Source
Learning Objective:	• The trainee will be able to properly operate the gravity and pressure feed systems on a water distributor
Samples of Behavior:	• The trainee will demonstrate how to utilize the gravity and pressure feed system on a water distributor
Notes:	
• Personnel are required to wear all personal protective equipment pertaining to each task (i.e. work gloves, hearing protection, and safety goggles)	
• Any safety violation is an automatic failure	

GRAVITY FEED

PRESSURE SPRAY

Background: The gravity feed and pressure spray systems of a water truck are two functions of the spray bar. When the spray bar is utilized with added pressure from the rear engine and water pump, it is called pressure spray. Gravity feed is exactly as it implies, water is forced through the spray bar from the natural weight of the water. During construction, the water truck is used to add moisture when compacting fill material and controlling dust on roads. At the end of the duty day, the tank should be drained to reduce the possibility of rust build up and water freezing in the pipes. Once completely drained, all valves should be placed in the closed position.

Gravity Feed. *To properly perform gravity feed, follow these steps:*

Start Application

Step 1: Close fire hose valve.

Step 2: Open main tank valve.

Step 3: Open spray bar valve.

Step 4: Place truck in motion.

Stop Application

Step 5: Stop truck.

Step 6: Close spray bar valve

Step 7: Close main tank valve

Pressure Spray. *To properly perform pressure feed, follow these steps:*

Start Application

Step 1:Start the auxiliary engine

Step 2: Close fire hose valve

Step 3: Close spray bar valve

Step 4: Open main tank valve

Step 5: Select desired auxiliary engine speed

Step 6: Place truck in motion

Step 7: Open supply valve and start spraying

Stop Application

Step 8: Close main supply valve

Step 9: Stop truck

Step 10: Throttle auxiliary engine down

Step 11: Close main tank valve

Review Questions
for
Gravity Feed

Pressure Spray

Question	Answer
1. The gravity feed and pressure spray are two functions of the water truck.	a. True b. False
2. When the spray bar is utilized with added pressure from the rear engine and _____, it is called pressure spray.	a. water spray pump b. coolant pump c. water pump d. spray bar pump
3. In construction, the spray bar is used to add moisture for compacting fill material and controlling _____on roads.	a. gravel b. seepage c. drainage d. dust
4. A step in the gravity feed process is to keep the truck immobile and perfectly level.	a. True b. False
5. To shut down the pressure spray, throttle the engine up.	a. True b. False

GRAVITY FEED

PRESSURE SPRAY

Performance Checklist		
Step	**Yes**	**No**
Gravity Feed Steps		
1. Closed fire hose valve?		
2. Opened main tank valve?		
3. Opened spray bar valve?		
4. Placed truck in motion?		
5. Stopped truck?		
6. Closed main tank valve?		
Pressure Spray Steps		
1. Started auxiliary engine?		
2. Opened fire hose valve		
3. Closed spray bar valve?		
4. Opened main tank valve?		
5. Selected desired auxiliary engine speed?		
6. Placed truck in motion?		
7. Opened supply valve and started spraying?		
8. For shutdown, Closed main supply valve?		
9. Stop truck		
10. Throttled auxiliary engine down?		
11. Closed main tank valve?		

FEEDBACK: Trainer should provide positive and/or negative feedback to the trainee immediately after the task is performed. This will ensure the issue is still fresh in the mind of both the trainee and trainer.

WATER DISTRIBUTOR

MODULE 17 **AFQTP UNIT 2**

FILL FROM HYDRANT (17.2.2.3.)

Notice. This AFQTP is *NOT* intended to replace the applicable technical references nor is it intended to replace hands-on training. It is to be used in conjunction with these for training purposes only.

FILL FROM HYDRANT

Task Training Guide

STS Reference Number/Title:	17.2.2.3. Fill from Hydrant
Training References:	• T.O. s 36C5, 36C20 Series • Owner's Manual • Local Procedures
Prerequisites:	• Possess as a minimum a 3E231 AFSC
Equipment/Tools Required:	• Personal Protective Equipment • Water Distributor • Fire Hydrant • Fire Hose
Learning Objective:	• The trainee will be able to properly fill a water distributor from a hydrant
Samples of Behavior:	• The trainee will demonstrate how to fill a water distributor from a hydrant
Notes:	
• Personnel are required to wear all personal protective equipment pertaining to each task (i.e. work gloves, hearing protection, and safety goggles)	
• Any safety violation is an automatic failure	

FILL FROM HYDRANT

Background: There are multiple ways to fill a water distributor. One such way is to use a suction pump to draw water from a water source such as a lake or stream. Another way is by pulling the truck under a pre-positioned overhead hose, called a water stand or a water station, and turning the water supply on. But, the most common way to fill a water distributor is directly from a hydrant.

To perform this task, follow these steps:

Step 1: Connect fire hose to hydrant

Step 2: Open manhole cover on top of water tank

Step 3: Place hose in manhole

Step 4: Secure hose in manhole

Step 5: Ensure all the valves on the distributor are closed

Step 6: Slowly open fire hydrant

Step 7: When finished, close fire hydrant

Step 8: Disconnect and secure hose

Step 9: Close and secure manhole cover

Review Questions
for
Fill from Hydrant

Question	Answer
1. There is only one way to fill a water distributor.	a. True b. False
2. The most common way to fill a water distributor is directly from the hydrant.	a. True b. False
3. After filling the tank from a fire hydrant, the hydrant valve may be left open and the water allowed to flow into the drainage system.	a. True b. False

FILL FROM HYDRANT

Performance Checklist		
Step	**Yes**	**No**
1. Connected fire hose to hydrant?		
2. Opened manhole cover?		
3. Placed hose in manhole?		
4. Secured hose in manhole?		
5. Ensured all valves on the distributor were closed?		
6. Opened fire hydrant valve?		
7. When finished, closed fire hydrant valve?		
8. Disconnected and secured hose?		
9. Closed and secured manhole cover?		

FEEDBACK: Trainer should provide positive and/or negative feedback to the trainee immediately after the task is performed. This will ensure the issue is still fresh in the mind of both the trainee and trainer.

WATER DISTRIBUTOR

MODULE 17 **AFQTP UNIT 2**

PERFORM OPERATOR MAINTENANCE (17.2.3.)

Notice. This AFQTP is *NOT* intended to replace the applicable technical references nor is it intended to replace hands-on training. It is to be used in conjunction with these for training purposes only.

PERFORM OPERATOR MAINTENANCE

Task Training Guide

STS Reference Number/Title:	17.2.3. Perform Operator Maintenance
Training References:	• T.O.s 36C5, 36C20 Series • Owner's Manual • Local Procedures
Prerequisites:	• Possess as a minimum a 3E231 AFSC
Equipment/Tools Required:	• Personal Protective Equipment • Water Distributor
Learning Objective:	• The trainee will be able to properly perform operational checks and maintenance on a water distributor
Samples of Behavior:	• The trainee will demonstrate how to perform operational checks and operator maintenance on a water distributor
Notes:	
• Personnel are required to wear all personal protective equipment pertaining to each task (i.e. work gloves, hearing protection, and safety goggles)	
• Any safety violation is an automatic failure	

PERFORM OPERATOR MAINTENANCE

Background: Any liquid material distributor, like other maintenance, is very important. If the machine is not running well then how is the job going to get done? The more effective maintenance program we have for the equipment, the better our operation will run.

Correct and timely operator maintenance ensures equipment will do the job when needed and last longer saving the Air Force needless expenditure. A good operator maintenance program includes inspections to detect and correct minor deficiencies before they develop into major defects resulting in costly repairs. This also includes cleaning and servicing.

To perform this task, follow these steps:

Step 1: Cleaning.

Keep the vehicle clean. If you have trash or dirt all over the vehicle, you won't be able to find lubrication points from the lube charts. It will also be hard to inspect the dump truck for damaged or loose bolts.

Step 2: Lubrication.

Lubricate the vehicle according to intervals listed in the maintenance chart. If operating the machine in severe conditions then lubricate the machine more frequently. Be sure to remove all dirt from the grease fittings before lubricating and remove any grease that remains on the fitting after lubrication.

Step 3: Refueling.

Refueling the vehicle is easy, simply drive to the service station and fill the fuel tank. If your equipment can't be driven to the service station, you must arrange for the fuel truck to come to the job site. You should fuel any equipment operated **at the end of each working day** to prevent moisture from condensing and forming droplets in the fuel tank.

Step 4: Post Operation Inspection.

As stated in operational checks, inspection is the best way to ensure that you give the proper care to your equipment. Air intake breathers are of special importance. There are generally two elements: (1) the primary (outer) element and, (2) the secondary (inner) element. Under dusty operating conditions, clean both elements daily (even more often if working conditions are extremely dusty).

Review Questions
for
Perform Operator Maintenance

Question	Answer
1. Why is cleaning an important part of vehicle maintenance?	a. To minimize breakdowns and save the AF money. b. It is required by AF Form 1806. c. Enables you to find lubrication points from the lube charts d. It isn't.
2. Lubrication should be accomplished on the same schedule no matter what conditions the equipment is operated in.	a. True b. False

PERFORM OPERATOR MAINTENANCE

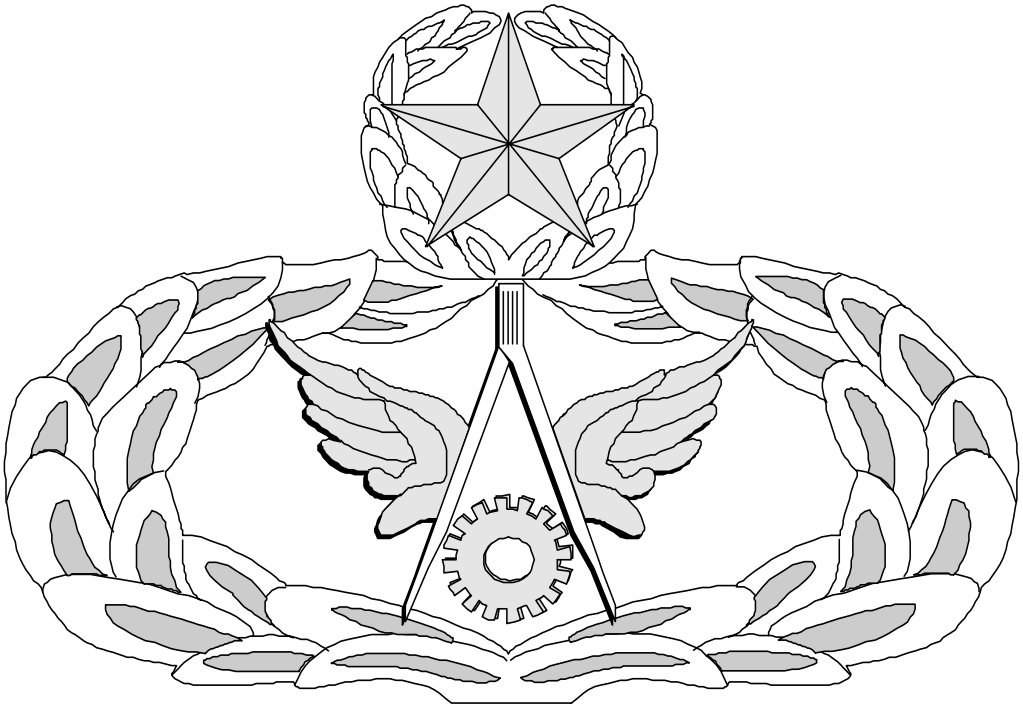
Performance Checklist		
Step	**Yes**	**No**
1. Cleaned?		
2. Lubricated?		
3. Refueled?		
4. Performed post-operational inspection?		

FEEDBACK: Trainer should provide positive and/or negative feedback to the trainee immediately after the task is performed. This will ensure the issue is still fresh in the mind of both the trainee and trainer.

Air Force Civil Engineer

QUALIFICATION TRAINING PACKAGE (QTP)

REVIEW ANSWER KEY



For

PAVEMENTS & CONSTRUCTION EQUIPMENT OPERATOR

(3E2X1)

MODULE 17

LIQUID MATERIALS DISTRIBUTORS

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PERFORM OPERATIONAL CHECKS

(3E2X1-17.2.1.)

Question	Answer
1. Check wheels and tires for _____.	d. All the above
2. Before you operate any piece of equipment, you must inspect it for _____.	a. Signs of damage or possible defects
3. You must use a checklist to do your inspections. The one you will use most often with heavy equipment is the _____.	c. AF Form 1806
4. Walk-around inspections only include detecting leaks, broken or missing items, and flat tires.	a. False
5. Which of the following items is not unique to the water truck?	c. Water bucket

GRAVITY FEED (3E2X1-17.2.2.1.)

PRESSURE SPRAY (3E2X1-17.2.2.2.)

Question	Answer
1. The gravity feed and pressure spray are both functions of the spray bar.	a. True
2. When the spray bar is utilized with added pressure from the rear engine and _____, it is called pressure spray	a. water pump
3. In construction, the spray bar is used to add moisture for compacting fill material and controlling _____on roads	a. dust
4. A step in the gravity feed process is to keep the truck immobile and perfectly level.	b. False
5. To shut down the pressure spray, throttle the engine up.	b. False

FILL FROM HYDRANT

(3E2X1-17.2.2.3.)

Question	Answer
1. There is only one way to fill a water distributor	b. False
2. The most common way to fill a water distributor is directly from the hydrant	a. True
3. After filling the tank from a fire hydrant, the hydrant valve may be left open and the water allowed to flow into the drainage system	b. False

PERFORM OPERATOR MAINTENANCE

(3E2X1-17.2.2.3.)

Question	Answer
1. Why is cleaning an important part of vehicle maintenance?	a. To minimize breakdowns and save the AF money
3. Lubrication should be accomplished on the same schedule no matter what conditions the equipment is operated in	b. False